The University of Chicago

LAND UTILIZATION IN MEMPHIS

A PART OF A DISSERTATION SUBMITTED TO
THE FACULTY OF THE DIVISION OF THE
PHYSICAL SCIENCES IN CANDIDACY FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF GEOGRAPHY
1936

By
RAYBURN WHITSON JOHNSON

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LAND UTILIZATION IN MEMPHIS[1]

FOREWORD

This dissertation deals with land utilization in Memphis, a city with an area of 45.67 square miles and with a population of 253,143 people in 1930. The location and distribution of eleven land types are shown on a land utilization map (Map-A). The eleven types are grouped into five major categories, four of which are displayed on the accompanying maps B, C, D, and E. The pattern of each type of land use, the localization of the major functional forms, and the intensity and transition of land use in the categories where intensity and transition are of marked importance are described and explained. A forecast, based on present trends and conditions, is made of the future land use in certain of the categories and to a degree serves as a statement of the probable future development of the city.

CHAPTER I.--MAJOR FUNCTIONS OF CITY AND GENERAL PATTERN OF OCCUPANCY

Major Functions of City

The major functions of Memphis are those functions which have contributed most to the growth and development of the city. In large measure, these functions are similar to those which have aided materially in the growth and development of Chicago, St. Louis, and New Orleans. These four midcontinental cities are spaced along the line of contact of the western territory, served by the transcontinental railroads; and the eastern territory, served by the trunk lines and southern railroads. This gives these four cities a unique place in American transportation. Of these four cities, Memphis is the smallest in area and population, and

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[1]This study of Land Utilization in Memphis is an abridgement of the author's doctoral dissertation on the same subject. In its complete form, the dissertation consists of 237 manuscript pages, 22 maps, 81 pictures, 23 tables, and 1 graph arranged in seven chapters and an appendix. The abridgement is so planned that it presents the first chapter and the first section of chapter five in full. For chapters two, three, four, six, and the second and third sections of chapter five only the findings and conclusions are presented. The dissertation was carried forward under the general direction of Dr. Charles C. Colby.

the least well known as a major transportation foci. Its role, nevertheless, is a distinctive and important one; and this fact has had and will continue to have a profound effect on the utilization of land in the city. Memphis is the most important railroad center within a radius of 300 miles. It is reached by four railroad main lines from the west side of the river, and by seven main lines from the east side of the river. The city is a terminal for all the main lines entering the city except those of two systems, the Illinois Central and the Frisco. The termini of the Illinois Central Railroad are at Chicago and New Orleans, but owing to the size and location of Memphis nearly midway between the termini, the city has more incoming and outgoing freight and passengers than any other station on the Mississippi Valley's most important north and south railroad. The Frisco trains which enter Memphis from the West continue to Birmingham over the company's own tracks, and on to Jacksonville, Florida over the tracks of the Southern Railroad. Memphis is a terminal for the passenger coaches of this line, but a new and unique through service is now offered by the pullman cars which the company operates between Kansas City, Missouri and Jacksonville, Florida.

Other functions have played their part in the city's growth and development, and a separate description of them gives the necessary background for an understanding of the character of land use in the city.

On navigable water body.--From the outset, the growth of Memphis has been closely related to its position on the Mississippi River. The city lies on the east bank of the river, about half way between St. Louis and New Orleans; and river steamers operating on the river have made regular stops at this point since the city was first founded in 1819. There are four barge lines operating as public carriers on the Mississippi at present. The barge lines operate between New Orleans and Minneapolis, St. Louis, and Pittsburgh. All tows call at the Memphis port; and for a part of the tows of three of the lines, the port is a terminal. Memphis is also a terminal for a dozen private carriers which operate barges regularly on the Mississippi.

Manufacturing center.--The excellent river and rail facilities of Memphis, together with the abundant supply of cotton and hardwood forests in the surrounding territory, have contributed materially to the high rank the city has gained as a manufactural

center. The city has many sawmills, planing mills, and other wood-working establishments; and the relatively large amount of space utilized by these manufactural plants is in harmony with the fact that the city is one of America's great lumber manufacturers, and is said to be the world's largest hardwood market.[1] There are in the city several large cottonseed crushing mills and mixed feed factories which are also in harmony with the fact that Memphis is said to be the world's largest producer of cottonseed products, and the South's largest producer of mixed feeds.[2] The last directory of manufacturing, published in 1931, lists 503 manufactural plants which produced $200,000,000 worth of products in 1930.

Distributing center.--Memphis is one of the most important distributing centers in the southern states, first, for the type of merchandise known generally as wholesale and jobbing goods; and second, for the type of manufactured goods like iron and steel which are shipped to Memphis in bulk to be distributed later throughout the trade area in carload and L.C.L. shipments,[3] or for the type of raw materials like cotton and lumber which are brought to Memphis from the surrounding territory in carload and L.C.L. shipments to be shipped later to the manufacturing districts in bulk.

Memphis is the only city with a population of more than 100,000 in a huge territory. St. Louis lies approximately 320 miles to the north, Nashville 230 miles to the northeast, Birmingham 250 miles to the southeast, New Orleans 390 miles to the south, and Little Rock 140 miles to the west. All of these cities compete with Memphis in the distribution of wholesale and jobbing goods in this territory, particularly, in the peripheral part. Owing, however, to the excellent transportational facilities of Memphis, it distributes the majority of wholesale and jobbing goods in an area which extends more than half way toward each of these cities with the exception of St. Louis. There were 408 wholesale establishments in the city in 1933 which did a net sales business of $178,895,000. Of the 408 establishments, 219 were wholesale proper,

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[1]The Research Bureau, Industrial Memphis, A Directory of Manufacturing (Memphis: Memphis Chamber of Commerce, 1931 ed.), p. 4.

[2]Ibid.

[3]L.C.L., abbreviation for less than carload lots.

95 were manufactures' sales branches, 71 were agents and brokers, and 21 were other types.[1]

The importance of Memphis as a collecting and distributing center for goods in transit is a situation related to the location of the city with respect to the river and rail patterns connecting the regions of supply and demand. Goods are shipped in barge, train, and carload lots from the manufactural districts of the East to Memphis where they break bulk, or are stored in large warehouses until they are shipped out to the Memphis trade territory. Memphis is the largest non-producing steel distributing center in the United States.[2] Steel pipe is shipped from the Pittsburgh-Youngstown region to Memphis by water, and is sent from Memphis to the consuming markets of the West and Southwest by train. Memphis is said to be the largest distributing center in the South for drugs and chemicals, and is a major distributing center for dry goods and wearing apparel.[3] The distribution area of Memphis extends furthest toward the south and southwest.

Lumber and cotton are the two principal products which are collected at Memphis from the surrounding territory and shipped out in bulk to the regions of consumption. About a seventh of the cotton of the United States, approximately 2,000,000 bales, passes through the Memphis terminal annually. About half of this amount is stored in Memphis warehouses.[4] Cotton, destined for domestic and foreign markets, is shipped in bulk from Memphis both by water and by rail. Lumber, like cotton, leaves Memphis for the domestic and foreign markets by water and by rail.

Capitol center.--Another function, which has contributed materially to the growth of Memphis, and which is true also of Chicago, St. Louis, and New Orleans, is that Memphis is a "capitol

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[1]Census of American Business: 1933, Vol. IV, Wholesale Distribution, South Eastern States (U.S. Dept. of Com.; Washington: Government Printing Office, May, 1935), p. 152.

[2]Ralph C. Hon, "Memphis, Its Economic Position," p. 6. Mr. Hon is Professor of Economics and Business Administration at Southwestern University located in Memphis. His article was mimeographed by the Memphis Chamber of Commerce March 3, 1935, and made available to the public. A few weeks later, the article appeared in the Commercial Appeal of Memphis in installments.

[3]The Research Bureau, op. cit., p. 4.

[4]Information concerning Memphis as a cotton center is from Mr. A. H. Bower, Secretary of the Memphis Cotton Exchange.

center." In Tennessee, Mississippi, and Arkansas, Memphis is called the Tri-State City. The city is located in the southwest corner of Tennessee, just across the river from Arkansas and only twelve miles from the Mississippi boundary line. People from the Tri-State Region come to Memphis to transact much of the governmental and financial business of the region. The seed loan office for the territory, and one of the large offices of the river engineers is located in Memphis. One of the branches of the federal reserve bank is located in the city. New motion pictures coming into the Tri-State Territory are first run in Memphis. The city is the best equipped hospital center within a radius of 200 miles. It is also one of the largest convention centers in the South. In these, and many other ways, Memphis has become a cultural center, as well as a transportational, manufactural, and commercial center, for a large territory.

General Pattern of Occupancy

Memphis, in general, has a rectangular pattern with its longer axis running east and west. The city ends abruptly on the west at the bluff of the Mississippi, rather regularly on the north along the floodplain of Wolf River, quite regularly on the east where there are no physical barriers to interfere with urban expansion, and with a markedly irregular boundary on the south. This southern boundary makes the western part of the city slightly wider than the eastern part.

Site pattern.--The general pattern of Memphis is closely related to site conditions, particularly, those of relief and drainage. The city is located on the left bank of the Mississippi at a point where the river swings to the eastern edge of its floodplain. The outside currents of the stream have cut into the bank and formed an almost vertical cliff, fifty to seventy-five feet high. It is for this reason that Memphis is called the "Bluff City." The city lies between two tributaries of the Mississippi, Wolf River on the north and Nonconnah Creek on the south. Wolf River flows westward along the northern border of the city in a flattish floored swampy plain until it reaches the natural levee of the Mississippi which turns it southward. After flowing southward for approximately three miles, the Wolf joins the Mississippi at the point where the latter reaches the eastern edge of its floodplain. Consequently, the bluff along the northern half of the western boundary of Memphis overlooks Wolf River in the foreground and the Missis-

sippi from one to two miles in the distance. Nonconnah Creek flows westward along the southern border of the city in a flattish floored but less swampy plain until it joins the Mississippi almost at a right angle. Wolf River and Nonconnah Creek are about eight miles apart. The floodplains of these two streams, together with the Mississippi, are barriers which give Memphis a peninsular pattern.

Memphis has a level to gently rolling terrain about 255 feet above sea level, and about 50 feet above the floodplain of the Mississippi. The drainage divide within the city runs east and west, slightly south of the center of the city. The terrain slopes gently from the divide to the top of the bluffs overlooking the floodplains of Nonconnah Creek and Wolf River. The slope to the north averages a drop of about ten feet to the mile, and the one to the south only about two feet to the mile. Only in one small area, just north of the southern limits of the city, is the relief broken enough to be called hilly and to interfere with a rectangular street pattern. Although the almost level relief of the city is terminated on the west, north, and south by the bluff overlooking the Mississippi and the floodplains of Wolf River and Nonconnah Creek, it extends for miles beyond the eastern limit of the city.

Cypress Creek and two small intermittent surface streams rise north of the divide and flow into Wolf River. Mallory Bayou, Cane Creek, and four other small surface intermittent streams rise south of the divide and flow into Nonconnah Creek. Only Cypress Creek is large enough to have any floodplain of its own, and to interfere with the development of a street pattern. These small streams aid materially in carrying away the surface water after heavy rains.

The soil of Memphis is a clay loam, and the subsoil is a loess formation of sand and clay. The subsoil contains some gravels, but very few stones larger than the size of an egg. Solid rock is not found near the surface. Water, gas, and sewer lines and excavations for building purposes can be made in the substrata of the soil with a minimum amount of energy and expense. The cultural mosaic of the city is therefore closely related to the natural factors of relief, drainage, and the subsurface strata.

Commercial pattern.--Memphis is a modified crescent type of city with the central shopping district located along the extreme

western margin of the city (Map-E). This district has not always occupied the same location. Its southward migration is due, in no little part, to the ever changing batture. At present, the longer axis of the district extends in a north-south direction for a distance of ten city blocks. The south end of the district is directly east of the point where the Wolf River flows into the Mississippi. The district is three and a half blocks wide from west to east. It is bordered on the north, east, and south by a crescent-shaped area containing functional forms for virtually every urban purpose. Because of the complexity of the functional forms, both vertically and horizontally, the crescent-shaped area will be referred to in this study as the heterogeneous belt.

The choice locations and the most intensely utilized lands of the heterogeneous belt are utilized for commercial purposes. The principal outlying commercial districts are scattered along the arterial streets that lead outward from the heterogeneous belt.

Residential pattern.--The residential pattern of Memphis is composed of a central residential area and six irregular projecting tentacles (Map-B). The central area is almost square and is divided into four quartiles by Madison Avenue which runs east and west, and Bellevue Street which runs north and south. The central area is bounded by Vollentine Avenue on the north, Parkway Drive on the east, and Person Avenue on the south.

Two irregular residential districts project from the central residential area toward the north, two project toward the east, and two project toward the south. The two districts projecting toward the east are the largest, and the two projecting toward the south are the smallest. The outlying residential districts are newer than the central residential area.

Railroad pattern.--The railroad terminal district of Memphis is located at the south end of the heterogeneous belt. All railroads except the Illinois Central and the Yazoo and Mississippi Valley reach the terminal district by a series of east-west tracks (located just south of the terminal) called Railroad Avenue (Map-D). The four western roads enter Railroad Avenue at its west end and four of the eastern roads enter it at its east end (at the western apex of the conspicuous triangle of railroad tracks).[1] The Belt

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[1]The triangle is formed by the tracks of the Belt Line on the southeast, the Frisco and Southern on the southwest, and the

.ne,[1] Railroad Avenue, and the Illinois Central main line form a circumferential band around the central part of the city. Only the rights of way of two railroads pierce the area inside the band, but the southern part of the city is crossed by the rights of way of six railroads. The Belt Line and the Illinois Central freight line separate the central residential area from the thickly settled parts of the two eastern residential districts.

Manufactural pattern.--The manufactural pattern of Memphis is very closely related to the railroad pattern of the city. Virtually all the heavy manufacturing plants are located on land parcels contiguous to a main line or spur railroad track. The manufactural lands of the city are divided into three districts (Map-D). The north manufactural district is the shape of the figure 7 turned 90 degrees to the left. The ribbon-type pattern extends along the rights of way of the western part of the Louisville and Nashville freight line, the Illinois Central main line, and the northern part of the Belt Line. The east manufactural district includes the manufactural lands scattered along the rights of way of the Belt Line, the Illinois Central freight line, and the Nashville, Chattanooga and St. Louis Railroad east of the conspicuous railroad triangle, and south of the north manufactural district. The south manufactural district includes all manufactural lands scattered along the rights of way of the railroads in the southern part of the city.

Street pattern.--The main street pattern of Memphis is a rectangular gridiron type (Map-C). The generally north-south streets near Wolf River run parallel to the river which flows slightly west of south for the last two miles before it enters the Mississippi. The generally east-west streets near the river run at right angles to the ones paralleling the river. Six to ten blocks east of the river, the generally east-west streets take a more direct east-west course; and the cross streets a more direct north-south course. The longer axes of the city blocks are about equally divided between east-west and north-south directions.

Louisville & Nashville and Nashville, Chattanooga, & St. Louis railroads on the north.

[1]The Belt Line is the local name applied to the Union Railroad. This road is owned by the Missouri Pacific Railroad but operates as an independent road. The road lies wholly within the city. Because of its circular pattern, it is called the Belt Line.

There are five small areas in the city which have an irregular type of street pattern. One is located in the northeast corner of the central residential area, three are in the south tentacle of residential land extending to the east, and one lies in the southern part of the city. The winding street pattern in the three northern areas is the result of an effort on the part of the owners of the subdivisions to develop an artistic street pattern. The irregular street pattern in the extreme southeast corner of the city is due largely to the general direction of Lamar Avenue on the northeast, and to Yale Yards on the southwest. The most irregular street pattern in the city is located in South Memphis. This cultural pattern is in harmony with the fact that the area is the hilliest part of the city. The primary streets follow the valleys and ravines, and the connecting streets are laid out so as to avoid the steepest grades.

Chelsea and Jackson avenues lead diagonally from the central shopping district to the northeast part of the city, and Lamar and Mississippi avenues lead diagonally from the central shopping district to the southeast part of the city. These four are important arterial streets. The other seven important arterial streets leading from the central shopping district are Second Street leading to the north, Florida Street leading to the south, and Summer, Poplar, Madison, Union, and Central avenues leading to the east part of the city. Madison is the dividing street between north and south Memphis. It is paralleled by Poplar Avenue two blocks to the north, and by Union Avenue one block to the south. These three are the principal commercial streets of the city outside the heterogeneous belt. Union Avenue carries the heaviest automobile traffic of any street in the city.

Stages in the evolution of the city pattern.--Memphis was founded in 1819. The original part of the city extends along the lower east bank of Wolf River for seventeen blocks. This original part is only two and a half blocks wide from east to west. In 1832, the city was made three and a half blocks wide; and in 1848 the eastern boundary was moved out to Gayoso Bayou, an average distance of a long block.

In 1849, the boundary was moved far enough to the east and to the south to enlarge the city approximately three times, the old part of the city, the new area to the east, and the new one to the south each being about the same size. The pattern of the city

for the following twenty-one years was rectangular, with the east-west axis about 75 per cent as long as the north-south axis.

In 1870, the city limits were extended about six blocks toward the north, and far enough toward the south to include what is now Railroad Avenue and the river-rail terminal district. For the following twenty-nine years, the city contained a pronounced rectangular pattern with the north-south axis about two and a half times as long as the east-west axis. The pattern reflects the importance of river transportation during the early reconstruction period.

The city made its most phenomenal areal expansion in 1899.[1] At this date, the area was increased approximately four times. This was the first and only time that all the land boundaries of the city were moved outward at the same time. The northern boundary was extended about a quarter of a mile, the southern boundary about a mile, and the eastern boundary more than two miles. The shape of the new city was almost a square. The square pattern bespeaks the change from river to rail transportation, a condition in harmony with the fact that six new railroads entered the city between 1880 and 1890.

The eastern boundary of the city was extended about 2,000 feet in 1909. The north and south boundaries along the west half of the city were extended about the same distance. In 1913, the southern boundary was extended so as to include Riverside Park, and in 1917, the eastern boundary was extended so as to include the Tri-State Fairgrounds. In 1919, the eastern boundary was extended about three-fourths of a mile, and the west half of the south boundary was extended for an average of about a half mile. Four city blocks were added to the northern part of the city in 1925. An area about four times the size of the latter was added to the east-

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[1]The population of Memphis in 1870 was approximately 40,000 people. The yellow fever epidemic of 1873 reduced the population to 25,000. After this date the population increased rather rapidly and reached approximately 100,000 in 1899. During the 29-year period from 1870 to 1899, the land area of the city remained unchanged. For a number of years prior to 1899, a large percentage of the population of the city lived outside the city limits, but the city did not wish to obligate itself to build streets, sewer and water mains, and provide police and fire protection over additional lands during the reconstruction period following the Civil War and the yellow fever epidemic. The date 1899 marks the year the city felt able to assume the new and additional responsibility.

ern part of the city at the same date. A considerable portion of the northern one of the two eastern residential districts, known as Highland Heights, was added to the city in 1927.

The second most phenomenal areal expansion of the city came in 1929,[1] when the city was approximately doubled in area, and when all the land boundaries were moved outward except for a distance of 3,000 feet along the south end of Riverside Park, and for a distance of 250 feet just east of Mississippi Avenue. No changes have been made in the area of the city since 1929. The present city pattern is rectangular in shape with the north-south axis only about three-fourths the length of the east-west axis. Owing to the fact that the north boundary has reached the swamp lands of Wolf River, and the south boundary is within a short distance of the floodplain of Nonconnah Creek, the city is likely to remain roughly rectangular in shape with the ratio of the east-west axis to the north-south axis becoming more and more pronounced.

Convenient divisions of the city.--For convenience in referring to different parts of the city, Memphis is divided into six major areas, and part of these are subdivided into minor areas. The central shopping district, the heterogeneous belt, and the central residential area have already been described. The newer parts of the city, located to the north, east, and south of the central residential area, will be referred to as North, East, and South Memphis. The central residential area is divided into northwest-northeast, southwest, and southeast quartiles.[2] The west end of North Memphis contains the area around the old North Memphis Driving Park, and the east end is known as Hollywood. The north end of East Memphis contains the Binghampton and Highland Heights com-

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[1]The reason for the phenomenal expansion of the land area of the city in 1929 was quite different to the one in 1899. The improved business conditions during the post-war period, and a municipal pride on the part of the people and city officials to push the city into the quarter of a million class in the 1930 census, led to an areal expansion which brought into the corporate limits of the city vast open spaces, and still other areas with only scattered urban forms.

[2]For convenience in locating certain land areas in the city pattern, the city is also divided into zones. That part of the city which surrounds the heterogeneous belt is called the inner zone. Surrounding the inner zone is the middle zone, and surrounding it is the outer zone. The city, therefore, has a central shopping district, a heterogeneous belt, and an inner, a middle, and an outer zone.

munities.[1] South Memphis contains the New South Memphis and Glenview Heights communities.

City plan.--On March 30, 1920, an ordinance was passed by the City Commission creating a City Planning Commission. A comprehensive city plan for the future use of land was made and published by the Commission in 1924.[2] This plan carried a future "use district map" of the land in the city at that time. The use district map showed two kinds of residential districts; and commercial, industrial, and unrestricted districts. Since that date, a sixth land use has been added to the plan. It is called apartment-shop district. The most recent future land use map of the city is the 1934 edition "use district map" of the City Planning Commission.[3]

Land Utilization

The first use district map of the City Planning Commission was not made until 1924. This map and all subsequent ones show what new uses may be made of the land in the future, but make no attempt to show the actual usage of the land in the city. The actual uses of the land include the uses that existed prior to the origin of the City Planning Commission, as well as the uses that have come about since its origin. The actual uses of the land fall into eleven categories (Map-A). The eleven categories are grouped under five larger divisions, which divisions form the bases for the next five chapters of this study.

CHAPTER II.--LAND UTILIZED FOR RESIDENTIAL PURPOSES

1. Land utilized for residential purposes are estimated to occupy approximately 38 per cent of the total land area of the city.

2. On the basis of homogeneity established by the application of selected criteria, the residential lands break down into fifty-five communities. The fifty-five communities divide into two major divisions on the basis of color of occupants. The communities with white occupants group into three divisions on the

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[1]The term community as used in this study is an area fairly homogeneous in the size, value, material, and architecture of its buildings.

[2]Harland Bartholomew, A Comprehensive City Plan of Memphis, Tennessee (Memphis, 1924).

[3]Zone Ordinance and Land Subdivision Rules for Memphis, Tennessee (Memphis: Memphis City Planning Commission, 1934).

basis of value, namely, A-type, B-type, and C-type. The communities occupied by negroes form the D-type class. Of the fifty-five communities, 7 are A-type, 17 are B-type, 17 are C-type, and 14 are D-type.

3. The A-type residential communities include those residential lands with white occupants in which the properties have an average value of $10,000 or more. These communities occupy the choice locations in the residential pattern, contain the most luxurious homes, present the most artistic appearance in the residential landscape, and house the most well to do people in the city. Five of the communities lie in the middle zone of the city and two lie in the outer zone.

4. The B-type communities include those residential lands with white occupants in which the properties have an average value ranging between $4,000 and $10,000. From the standpoint of desirable location, these communities occupy those areas in the residential pattern next in scale to the A-type areas. Although the residential forms vary widely in age, size, material, and architectural style, the most characteristic type is that of the American one-story bungalow. A very high correlation exist between the age of the B-type communities and the prevailing construction material used in the buildings as evidenced by the fact that the nine newer communities (8-16) contain a relatively high percentage of brick residences, that the five middle-aged communities (17-21) contain a general mixture of brick, wood, and stucco residences, and that the three older communities (22-24) contain residences, virtually all of which are built of wood. Eight of the B-type communities lie in the eastern half of the central residential area, two lie in the western half of it, three lie in East Memphis, three lie in South Memphis, and one lies in North Memphis. The B-type communities, in general, are used for housing the better salaried people of the city.

5. The C-type communities include those residential lands with white occupants in which the properties have an average value $4,000 or less. These communities contain the least desirable areas in the residential pattern occupied by white people. The residential forms vary widely, a condition due largely to the fact that part of the buildings are C-type because of original value, whereas others are C-type because their values have depreciated due to deterioration. As in the B-type communities, the age of

the communities is closely related to the prevailing construction material used in the buildings. In the eight newer communities (25-32), brick and wooden residences are about equally divided, whereas in the six older communities (36-41) there are considerably more wooded than brick residences. An apparent fallacy to this conclusion is that communities 34 and 35 contain a large percentage of brick and stucco residences, and yet they are very old as indicated by their locations in the city pattern. These communities, however, were of a higher type prior to the deterioration of their large residences, and form an exception to the general conclusion. The C-type communities form a U-shaped pattern around the northeast quartile of the central residential area. Six of them lie in the western half of the central area, three lie in the eastern half of it, five lie in East Memphis, two lie in South Memphis, and one lies in North Memphis. The C-type communities are used for housing the lower salaried people of the city, many of which are unskilled workmen.

6. The D-type communities include those residential lands occupied by negroes, irrespective of the value of the property. The communities occupy the least desirable areas in the entire residential pattern. In general, the negro communities occupy the areas with the lowest elevations, many of which are traversed by small creeks and bayous. The low areas are very poorly drained. The D-type communities are bordered by lands utilized for railroads and factories considerably more than either of the other three types. The residential forms of the D-type communities have the widest range in value and architectural styles of the four types. The number of living units per residential form, and not the constructional material, is the best criterion for dividing the D-type communities for virtually all the residences are built of wood except in certain of the old communities which the negroes have taken largely by invasion. In nine communities (42-50), virtually all the residential forms are the one-family type, whereas in the other five communities (51-55) a large percentage of the residential forms house more than one family. The small framed cottage, boxed cabin, and shotgun type of house predominate in the communities with one-family residences. In certain parts of communities 44-50, nearly all the houses are the shotgun type. These houses are built of undressed lumber and are not painted. Almost every size and kind of residence are found in the five older communities

which lie in the western part of the city. The general mixture is due, in part, to the fact that the relatively small percentage of well to do negroes of the city live in these communities, and, in part, to a migration of the negroes into the old communities near the business district, formerly occupied by well to do white people. The negro ark and the barracks type of flats are two of the characteristic types of multi-family housing forms in the negro communities near the business district. The negro communities form an O-shaped pattern around the eastern part of the central residential area. Four of the communities lie in the western half of the central area, two lie in the eastern half of it, four lie in North Memphis, three lie in East Memphis, and one lies in South Memphis. In the 14 D-type communities are housed approximately 100,000 negroes, or three-eighths of the total population of the city.

7. Residential areas used for housing the well to do white people in the past have shifted with the areal growth of the city as evidenced by the fact that the heterogeneous belt, and communities 24, 34, 35, 40, and 51 has each had its heyday in the evolution of the city. That this shifting is still going on, is shown by the fact that the three newer A-type communities (1-3) are in, or at the margin of, the outer zone of the city, whereas the four older A-type communities (4-7) are all located in the middle zone.

8. The greatest transitions in the residential lands have taken place in the western half of the central residential area where the communities have, and still are passing from a higher to a lower order. The old white communities near the business district are gradually being invaded by negroes.

9. The intensity of usage of the residential lands, as based on population density and the spacing of residential forms and living units, gradually increases from the newer A-type communities through the older D-type communities. In contrast to this, the value of the average living unit decreases.

10. Unoccupied lands used for residential purposes in the future are necessarily limited to the vacant lands lying in the outer zone of the city and to the lands in the peri-urban zone. All indications are that the new negro communities will be located in North and South Memphis, and that the new white communities will be located in East Memphis.

CHAPTER III.--LANDS UTILIZED FOR PUBLIC PURPOSES

1. Lands utilized for public purposes occupy approximately

36 per cent of the total land area of the city (Map-C). This category includes all the occupied lands in the city not owned by private citizens or corporations. These lands, on the basis of function, fall into four classes: (1) institutional lands, (2) recreational lands, (3) city lands operated for public purposes, and (4) lands utilized for cemeteries.

2. The institutional lands (churches, schools, and other institutions on Map-C) are utilized for public, semi-public, private, and eleemosynary institutions. The spacing of the institutional lands is closest in the areas having the densest population, consequently the distance between them gradually increases from the inner to the outer part of the city.

3. There are in the city 375 churches, 162 of which are for whites and 213 of which are for negroes. Since the negroes have more churches than the whites and since all the negro churches are located in areas which taken together make up about a third of the residential lands, the spacing between the negro churches is considerably less than it is between the churches of the white people.

4. The migration of the church function from the inner zone to the middle and outer zones of the city is evidenced by the location of four large churches on or near Union Avenue east of Bellevue, and by the location of two large ones in the outer zone near the State Teachers College, all of which are relatively new.

5. The localization of white churches in the city in the past has been closely related to (1) the residential pattern of the areas occupied by whites, (2) the location of the better residential communities, (3) the denominational membership patterns, (4) individual and small-group initiative, and (5) sites near the mathematical center of the city.

6. There are in the city 97 schools, four of which are colleges. The percentage of public schools located in the western half of the city is even greater than the percentage of the city's population located in the western half. This is particularly true of the high schools as evidenced by the fact that only two of the thirteen high schools are located east of Cleveland Street, the north-south street carrying the cross-town car line (Cleveland Street is marked by the letter E in East Industrial district on Map-D).

7. The sites of the four colleges in the city have been selected largely in terms of the function of the individual insti-

tutions as evidenced by the location of (1) the Medical School between the two leading east-west arterial streets, Madison and Union, at a point near the business district of the city, and bordering the largest two hospitals of the city, (2) LeMoyne College for negroes in the heart of the largest negro area in the city, and (3) State Teachers College and Southwestern University in the outer and newer parts of the city where desirable space was available for lecture and laboratory buildings, residence halls, and athletic fields.

8. In terms of students per school, the high schools are slightly more intensely utilized than the elementary schools, and the negro schools are considerably more intensely utilized than the white schools.

9. Many of the institutions requiring only small land parcels, such as the municipal buildings, post office, libraries, social and religious clubs, are located in or near the central shopping district, an area with the greatest functional convenience to the largest number of people.

10. The hospitals are located in the inner zone of the city, a zone easily reached both from the business district and from the residential communities, and also one relatively free from noise, particularly, at the time most of the hospitals were built.

11. The recreational lands consist, in the main, of twenty-eight parks, twenty-four playgrounds, the fairgrounds, two swimming pools, fifteen tennis grounds, nine community houses, and eight golf courses. The parks, playgrounds, and golf courses alone contain 3.23 square miles, or 7 per cent of the total land area of the city.

12. The spacing of the recreational lands is considerably closer in the inner half of the city where the population is densest, but the acreage of recreational lands is considerably more in the outer half where more land was available at a relatively low cost at the time the larger recreational grounds came into being.

13. The location of all the golf courses and both of the large parks in the outer half of the city reflect the relative newness of golf as a major sport, and a latent desire on the part of the general public to conserve certain natural beauty spots in the landscape.

14. The number of golf players on the three municipal courses is about double the number of players on the other five courses .

This fact reflects the high quality of the municipal courses, the efficient manner in which they are operated, and the fact that no fees are charged on one of the municipal courses.

15. Transitions of land use in the areas now utilized for golf courses are most certain to come as the city increases in population. It is not likely that either of the five privately owned courses will continue to be used for that purpose. Two of these are owned by land companies which, in all probability, would have already opened new residential subdivisions had the economic depression not come over the city. Legal proceedings concerning the tract of land containing the course located in the corner of the Belt Line and the Nashville, Chattanooga and St. Louis railroads have been pending in chancery court ever since the area was taken into the city. Part of this area is zoned for residential, part for commercial, and part for industrial uses. When the case is finally settled, no doubt the area will be used for these purposes. The tract of land owned by the Memphis Country Club and the one owned by the Chickasaw Country Club were bought and developed into golf courses when the land was relatively cheap and when the eastern limits of the city lay two miles to the west of them. Each of these courses now occupies a choice location in the residential lands of East Memphis. Either club could make money by selling its land for a new residential subdivision and establishing a new club to the east of the city limits.

16. The tennis courts are much more intensely utilized during the months May to September inclusive, the heart of the tennis season. Approximately 64 per cent of the tennis registrations are made at Fairground and Beauregard Field courts, a fact closely related to the central location of these courts with respect to the transportation and population patterns of the city.

17. The total number of participants taking part in supervised recreation annually is very much greater during the months of June, July, and August than during any other three months in the year, a fact which mirrors (1) the effect of seasons on supervised recreation, and (2) the vacation period of the public and parochial schools.

18. The two modern pumping stations have a combined capacity for pumping 45 million gallons of water each 24 hours. In the vicinity of one (Parkway Station) are 35 artesian wells, and in the vicinity of the other (Sheahan Station) are 13 wells. About three-

fourths of the wells tap a water stratum approximately 450 feet below the surface of the ground, and a fourth of them tap a water stratum approximately 1,400 feet below the surface. Each of the stations has its own reservoir and purifying plant, but the two function as one system, and the water from them is carried to 45,541 individual connections through 600 miles of subsurface water mains which range in diameter from six to forty-eight inches.

19. Most of the seventeen fire engine stations are located in the inner half of the city. The distribution of these stations is in harmony with the functional form pattern of the city.

20. Lands utilized for incinerators and dumps are located in the periphery of the city where the odor and unsightly appearance of such lands are least offensive, and on lands poorly suited for other urban purposes.

21. All the cemeteries with any appreciable acreage are located near the south central margin of the city, and in the vicinity of the very large Forest Hill Cemetery which lies just outside the southern limit of the city. The cemetery area is one of relatively high elevation on the opposite side of the city from the two pumping stations, and was used for burying purposes long before the areal pattern of the city reached it.

CHAPTER IV.--LAND UTILIZED FOR RAILROAD AND INDUSTRIAL PURPOSES

1. Lands utilized for railroads and for manufactural purposes form approximately 5.5 per cent of the total land area of the city.

2. The railroad lands are composed of the freight and passenger terminals, the rights of way of the main lines, the large number of spur tracks, and the classification yards.

3. With the exception of one freight depot, all the terminals of Memphis are localized in a central terminal district. The district is rectangular in shape and is located between the retail and wholesale districts on the north and Railroad Avenue and the two bridges across the Mississippi on the south and southwest. The longer axis of the rectangle runs east and west with the west end extending to the top of the bluff overlooking the Mississippi. In the district are six freight depots and both of the passenger stations. Each of the eight has its north frontage on Calhoun Street, a street easily reached from the wholesale and retail districts. The concentration of the seven terminals in a central

terminal district is a triple example of centripetal forces, namely, site attraction, functional megnetism, and functional convenience.

4. Railroad Avenue parallels the southern boundary of the central terminal district (referred to in the text as the Rectangle), the west end of the Avenue lying directly south of the west end of the Rectangle, and about a half mile from the eastern approaches to the two bridges spanning the Mississippi. The Avenue extends eastward for two and a half miles and terminates in a conspicuous triangle of railroad tracks. The four western railroads enter Railroad Avenue at its west end, and the Louisville and Nashville, Nashville, Chattanooga and St. Louis, Southern and Frisco railroads enter it at its eastern end. The trains of the Illinois Central and its subsidiary, the Yazoo and Mississippi Valley, are the only ones that do not reach the terminal district by Railroad Avenue. Thus it is seen that the Rectangle, the Triangle, Railroad Avenue, and the two bridges across the Mississippi form the concentration points in the railroad pattern of the city. The rights of way of the Illinois Central main line on the west, the Belt Line on the north and east, and the Belt Line and the lines on Railroad Avenue on the south form a circumferential band around the central part of the city. Memphis is a terminal for all railroads entering the city except those of the Illinois Central and the Frisco, and Memphis and New Orleans are the two principal cities where the transcontinental lines from the southwest meet the southern lines from the southeast. The terminal aspect has done much to make Memphis an important railroad center and also has had a profound effect on the land use pattern of the city.

5. The spur tracks, in the main, lie along the rights of way of the main lines which serve the wholesale, warehouse, and manufactural districts of the city. Considerably more than half of them lie along the railroad rights of way that surrounds the central part of the city. The largest cluster of spur tracks is located southwest of the terminal district, and the second largest cluster is located in the extreme northwest corner of the city. Both areas are important for heavy manufacturing.

6. The inner classification yards lie in a zone bordering the railroad rights of way that surrounds the central part of the city. To the south and west is an outer zone of classification yards, all of which, except the Yale Yards of the Frisco, lie out-

side the city. The amount of land used for classification yards is relatively high, a fact in harmony with the terminal aspect of the city which requires a very high percentage of intra-road movement of through cars. The operation of an inner and an outer yard by the same railroad, as the South and Nonconnah yards by the Illinois Central and the Calhoun Street and Yale Yards by the Frisco represents as an example of centripetal forces in the localization of the inner yards and centrifugal forces in the localization of the outer yards.

7. The intensity of usage of the railroad lands is relatively high as shown by the fact that 52 passenger trains and 113 freight trains were arriving and departing from the city every 24 hours during the month of June 1935.

8. The transitions in railroad lands have been good as far as they have gone. The centralizing of all the terminals (except one) into a central terminal district has proven to be an excellent adjustment of land use. The rights of way of the Louisville and Nashville and the Southern railroads which lie inside the railroad band encircling the central part of the city form considerable barriers to the development of the street pattern in the respective areas. If the city could buy these rights of way, remove the railroad tracks, convert the rights of way into arterial streets, and connect the various streets that now have dead ends along these roads, the street pattern of the entire central residential area would be greatly improved.

9. The port lands are made up of four noncontiguous terminals with a total water frontage of 3.67 miles. The north terminal with 51.8 per cent and the municipal terminal with 12.0 per cent of the total port lands lie along Wolf River. The river-rail terminal with 30.9 per cent and the south terminal with 5.3 per cent of the port lands lie along the Mississippi.

10. The percentage of tonnage handled through the Wolf River terminals is even greater than the percentage of water frontage of the two, as evidenced by the fact that all the logs and cement, the cargo of three of the four corporate public water carriers, and the cargo of six of the seven iron and steel goods corporations are handled through the north terminal alone.

11. The principal reason for the greater frontage on Wolf River is that the bluff along the Wolf is considerably lower than the bluff along the Mississippi. Obviously, this condition makes

the cost of loading and unloading on the Wolf considerably less than on the Mississippi, and is an important factor in explaining the high percentage of tonnage handled through the terminals on the Wolf.

12. The leading incoming commodities handled through the docks of the corporate public water carriers are oil pipe and other steel goods, creosote, tar, sugar, coffee, canned goods, and general merchandise. The leading outgoing commodities are cotton, cottonseed products, lumber, scrap iron, rice, tobacco, and manufactured goods.

13. The intensity of usage of the port lands is shown by the tonnage handled through them. For the year 1933, the incoming tonnage was 762,335 tons and the outgoing tonnage was 328,279 tons. The value of the total tonnage was slightly more than 57 million dollars. Four corporate public water carriers operate in and out of the port. One of the corporations operates two tows each way weekly, and each of the other three operates one tow each way weekly. Each towboat pushes from eight to twenty barges.

14. The expansion of port lands during the next one or two decades is most certain to be along Wolf River. The river is now navigable for a distance approximately 2.5 miles above its mouth and a federal grant was secured in 1935 to extend the navigable water of the river for an additional mile.

15. The manufactural lands include those lands used for manufactural purposes and range in size from a fractional part of an acre to 286 acres. Virtually all of them lie along the railroads, and a majority lie along the rights of way of the railroads surrounding the central part of the city. The pattern of manufactural lands divides into three districts, the north, east, and south manufactural districts.

16. The site and cultural qualities in the manufactural districts which help to explain the localization of the factories in them include (1) large parcels of unoccupied land available at relatively low cost not only for factory sites but also for receiving grounds and storage yards, (2) an abundance of fresh water suitable for the production of steam and milling processes and obtained from Wolf and Mississippi rivers and Nonconnah and Cypress creeks, (3) zoning regulation established by the City Planning Commission which make it possible to perfect economies in the layout and operation of the plants, (4) adequate highway, rail, and river trans-

portation facilities for assembling raw materials and for distributing finished products, and (5) the proximity of D-type and C-type residential communities which may be used for housing factory workers at a nominal cost.

17. The ribbon type pattern of manufactural lands in the north manufactural district, which very much resembles the figure 7 turned 90 degrees to the left, is one which coincides largely with the railroad lands of the Louisville and Nashville, Illinois Central main line, and the Belt Line.

18. On the basis of function, the lands and plants of the north manufactural district break down into five types, namely, woodworking, sand and gravel, cotton products, metallurgical,and chemical lands and plants.

19. The largest woodworking area in the entire city is located in the northwest corner of this district. This area is well suited to the woodworking usage for the area is served by both the Illinois Central and the Belt Line railroads, lies close to the log docks on Wolf River, has little traffic through it, and has been used for the woodworking industry since the origin of the industry in the city.

20. The location of the two sand and gravel plants in the central part of the district near Wolf River is due largely to the presence of subsurface strata which contain an abundance of high quality sand and gravel, and to the fact that the particular areas are ill suited to other urban purposes because the water table stands at or near the surface of the ground.

21. The largest of the relatively new manufacturing plants are located in the eastern half of the district where there was more desirable space as evidenced by a very large cottonseed oil mill, a large hardwood distillation plant, and a large centrifugal pump factory.

22. The land use pattern of the north manufactural district is quite dynamic as evidenced by several parcels of vacant lands which were used for large woodworking plants and lumber yards prior to 1929. With a return of better economic conditions, however, the factory lands in the north manufactural district are almost certain to increase.

23. The highly utilized part of the east manufactural district extends along a narrow belt which follows the Belt Line,Illinois Central freight line, and the Nashville, Chattanooga and St.

Louis railroads. This district is the smallest of the three and contains the fewest manufactural plants.

24. On the basis of function, the manufactural lands of the highly utilized part of the east manufactural district break down into three types, namely, woodworking, chemical, and cotton products lands and plants. There are two large plants of each type, and the two cotton products plants occupy contiguous grounds.

25. The age of the east manufactural district is reflected by its position in the city pattern, a position which lies outside the central residential area but inside the residential communities in the eastern part of the city.

26. Owing to the fact that the east Manufactural district divides the largest restricted residential area in the city at present, it is not likely that the district will expand very much, particularly, in width.

27. The south manufactural district includes all the lands utilized for manufactural purposes not included in the other two districts. This district contains the most asymmetrical pattern of the three. It contains the largest number of manufactural lands, but the average size of the individual lands is less than in the other two districts. The grouping of similar plants on the basis of function is less pronounced than in the other districts.

28. The factories of the south manufactural district lie along the Southern Railroad freight line, Railroad Avenue, the Belt Line, the cluster of spur tracks located to the southwest of the terminal district, and the main lines of the Frisco, Illinois Central, and Yazoo and Mississippi Valley railroads. On the basis of function, these lands break down into five types, namely, cotton products, woodworking, metallurgical, chemical, and food products lands and plants.

29. Four cottonseed oil mills and two cottonseed oil refining plants are outstanding in the cotton products group. The two refining plants are the two largest ones in the city. Each of the refining plants is contiguous to a cottonseed oil mill owned by the same company, and therefore, is ancillary in character. The four cottonseed oil mills rank among the larger ones of the city.

30. Closely associated with the cotton products plants are the mixed feed plants which use large quantities of cottonseed meal. There are seven mixed feed plants in the south manufactural district, three of which are large ones. The grounds of the mixed

feed units are relatively small, owing to the vertical gravity type of plant which functions best for making mixed feeds.

31. The south manufactural district has quite a variety of woodworking plants, but with the exception of three sawmills, located south of Parkway Drive, these units occupy relatively small parcels of land. In addition to sawing lumber, the woodworking plants manufacture building supplies, furniture, cabinet materials, tool handles, and cooperage products. With the exception of the three sawmills, most of the woodworking plants are located along Railroad Avenue, the Southern Railroad freight line, and the cluster of spur tracks southwest of the terminal district.

32. The major two metallurgical plants in the district are the Ford Automobile assembling plant located near the river at the north end of Riverside Park, and a plant for fabricating bridge and structural steel materials located just south of the terminal district.

33. The chemical group of plants in the south manufactural district is composed of a few plants manufacturing a variety of products such as paint, drugs, cosmetics, patent medicines, and spices. Most of the units are located in the northwest part of the district as their multiple-floor type of buildings require only small land parcels.

34. The food products plants of the district include dairy, bakery, flavoring extract, beverage, lard refining, and meat packing plants. With the exception of the meat packing plant located near the river just north of the Ford assembling plant, the land areas of the food products plants are very small.

35. The older factories of the south manufactural district are located along the Southern Railroad freight line, Railroad Avenue, and the cluster of spur tracks southwest of the terminal district. The newer factories lie further to the south along the main lines of the railroads traversing the district. This outward migration of the manufactural function is another example of the effects of centrifugal forces. In all probability, the manufactural lands of the future will be located to the south along the main lines because of the very desirable manufactural sites along them which are not utilized for any urban purpose at present.

CHAPTER V.--LAND UTILIZED FOR COMMERCIAL PURPOSES

Land in Memphis utilized for commercial purposes includes approximately 3.5 per cent of the total land area of the city (Map-E).

The commercial lands are made up of a large number of isolated fragments scattered throughout the city but these fragments break down into three areal groups: (1) a central shopping district, (2) an heterogeneous belt, and (3) the outlying commercial districts.[1] The central shopping district is the commercial core of Memphis, and a large portion of the retail and financial activities of the city are carried on in it. The heterogeneous belt borders the central shopping district on the north, east, and south, and contains most of the wholesale and jobbing establishments. This belt is heterogeneous both in functions and in forms, and constitutes a transition zone between the central shopping district and the residential areas of the city. The outlying commercial districts are of varying size and character, and include many neighborhood shopping centers, the highly important stock yards, the automobile sales and service concentration, and several other commercial areas.

The utilization of land in the commercial districts definitely reflects the commercial character of the city. The major wholesale and jobbing area, for example, is conspicuously developed, and in size and variety of establishments suggests the importance of Memphis in this line of activity. The four large department stores and the numerous fine shops in the central shopping district not only serve the city itself but a large surrounding area. In this connection it should be emphasized that although Memphis ranks thirty-sixth in population, it ranked thirty-fourth among the cities of the United States in 1929 in retail trade, with 3,147 stores and sales amounting to $151,235,162. The Memphis Union Stock Yards (operated by two large commission firms) is said to be the largest mule market in the United States, the iron and steel yards and warehouses distribute their products to much of the South and Southwest, and the cotton warehouses do a very large business.

The utilization of the commercial lands and structures naturally varies with activity in the major lines which make up the life

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[1] Because of the importance of the central shopping district in the life of the city, and because the analysis of this district well illustrates the method employed throughout the dissertation, the analysis of the central shopping district is presented in full. For the other two commercial areas only the findings and conclusions are introduced.

of the city, the total display of such lands and buildings being established during the period of greatest activity. This variation in utilization was evident during the course of the depression, vacancies increasing until 1933 and declining since that date. From 1929 to 1933 the number of retail establishments declined 22.3 per cent and the volume of sales declined 54.3 per cent.[1] The number of employees engaged in the retail distribution of merchandise declined from 15,381 to 9,163, or 40 per cent, and payrolls declined from $18,223,000 to $8,628,000, or 52.7 per cent. Department stores and mail order house sales declined 53.5 per cent but they still accounted for 24.2 per cent of the total retail sales in 1933.[2] Since that date the trend has been in the opposite direction. In per capita retail sales during 1933, Memphis, with $373, occupied a middle ground, being higher than Louisville, Birmingham, and New Orleans and lower than Atlanta, Dallas, and Houston. Memphis with its cotton business, its iron and steel trade, and its other commercial market lines felt the depression definitely and severely, and during the period of business decline land utilized for commercial purposes declined accordingly. The recovery of the cotton trade undoubtedly helped to reclaim some of the empty structures, but the slow recovery of the construction lines as late as 1935[3] was still retarding the use of some of the lands and buildings.

It is estimated that approximately 90 per cent of the trade carried on in the United States is by means of bank checks.[4] Bank debits, which reflect the volume of checks drawn, constitute a good index of general commercial activity. Since the figures are available through 1934, the bank debits of Memphis institutions give valuable information as to the extent to which commercial activities have recovered from the low mark of the depression. Bank

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[1]Hon, op. cit., p. 20.

[2]Census of American Business: 1933, Vol. III, Retail Distribution, County and City Summaries (Washington, D.C.: U.S. Department of Commerce, May, 1933). The total number of stores, amount of sales, number of proprietors, full time employees, and payroll for the ten different classes of retail establishments for the year 1933 are shown in Table V of the Appendix of the dissertation.

[3]The field study of the commercial districts was made in 1935, and is more representative of the long run utilization than either 1933 or 1929.

[4]Hon, op. cit., p.19.

debits were lowest in Memphis in 1932. The decline in Memphis from 1929 to 1932 was 55 per cent as compared to 53 per cent for 140 cities outside New York from which reports are available through the Federal Reserve Board. The average increase of the 140 cities from 1932 to 1934 was 7.5 per cent whereas the increase in Memphis for the same time was 21.9 per cent. Bank debits in Memphis in 1934 were 54.6 per cent as large as they were in 1929, as compared to 50 per cent for the 140 cities. These facts as applied to land utilization in the commercial districts of Memphis suggest an upward trend in the degree of utilization.

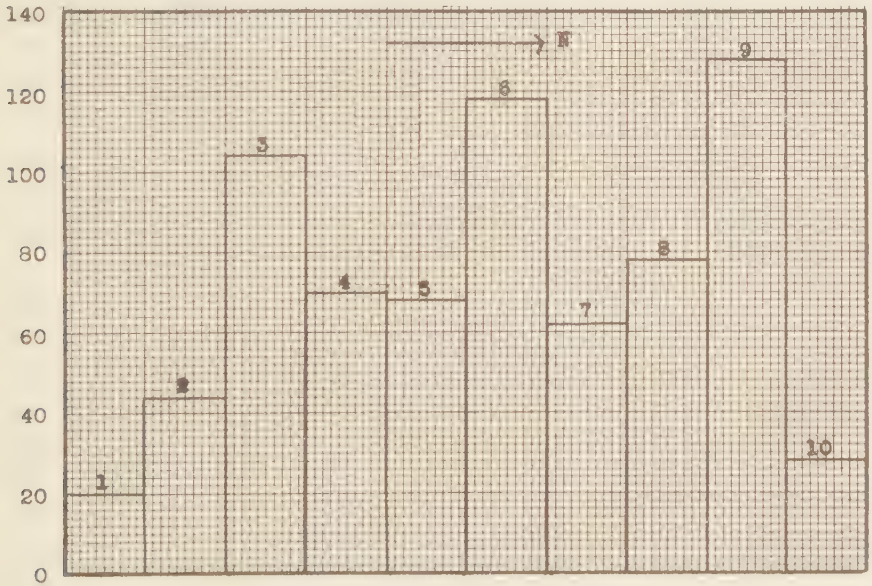
Central Shopping District

The central shopping district includes thirty-five blocks, being a rectangle ten blocks long and three and a half blocks wide. The longer axis extends from Beale Street on the south to Poplar Street on the north, and the shorter axis extends from Front Street on the west to the alley east of Third Street on the east (Map-E). The north-south streets named from the west are Front, Main, Second, and Third. Madison Avenue is the central east-west street, with Monroe, Union, Gayoso, and Beale streets to the south, and Court, Adams, Washington, Jefferson, and Poplar streets to the north. All streets north of Union, except Third, were included in the original city of 1819, and Third Street was taken into the city at the first change of the city limits in 1832. Although Poplar Street is now the north boundary of the central shopping district, it lies south of the central east-west axis of the original city. The south boundary of the original city as late as 1848 was still at Union Avenue. The central shopping district has clung to Main Street throughout the entire growth of the city, nevertheless, it has gradually migrated southward.

Localization of Main Street functional forms.--The frontage of all functional forms on Main Street between Poplar and Beale has been reduced to a common unit of measure, a "space unit." A space unit is a vertical square, fifteen feet on a side, or 225 square feet. In calculating the vertical distance, all stories of all buildings were arbitrarily taken as fifteen feet. The space units are grouped under eight headings according to function, namely, (1) sales, (2) sales storage, (3) service, (4) light manufacturing, (5) office, (6) public use, (7) residential, and (8) vacant. Of the 1,748.5 space units in the ten blocks, 41.9 per cent are utilized for the sales function, and 21.3 per cent are utilized for

the service function. Office space utilizes 16.3 per cent, sales storage space 4.7 per cent, residential space 0.9 of one per cent, light manufacturing and public use 0.1 of one per cent each, and vacant space 14.7 per cent. No attempt was made to ascertain the amount of vacant space in the office buildings. All such space, whether vacant or occupied, is included under office space.

Sales space units.--The part of Main Street in the central shopping district contains 732.5 sales space units. These units are not evenly distributed between the two sides of the street, or among the ten blocks, a situation due to the complexity of the cultural and natural environment. The number of sales space units in each block is plotted into the accompanying bar graph, which graph pictures to the eye the irregular distribution of the units. The number of units in the exterior blocks, one, two, and ten, are low as might be expected, but the number of units in blocks four, five, seven, and eight are also low as compared with the number in blocks three, six, and nine. The explanation of the irregularity is that each of the latter blocks (three, six, and nine) contains one of the large department stores of the city. Each of these stores occupies half of the frontage of the block in which it is situated, and consequently greatly increases the number of sales space units in the block.



Sales space units for the ten blocks on Main Street between Poplar and Beale.

Of the 732.5 sales space units in the ten blocks on Main Street, 493.5 are on the west side as compared with 239 on the east side. This high ratio of 2.06 to 1 is accounted for by the fact that all four of the large department stores are located on the west side. These four stores have a total of 262 sales space units. Without the four department stores, the west side has 231.5 sales space units as compared to 239 on the east side. In addition to the localization of the department stores on the west side of the street, five of the six large variety stores, and two of the five large furniture stores are on that side.

A recent study of St. Louis classifies all stores into three classes:[1] convenience-goods stores, such as food stores, eating places, and filling stations; shopping-goods stores, such as department stores, most apparel stores, and furniture stores; and specialty-goods stores, such as jewelry stores, luggage and leather goods stores, art and gift shops, and highly specialized apparel stores. It is the shopping-goods group of these three that forms by far the largest percentage of the total space units on Main Street, and the majority of these units are on the west side.

The outstanding reason for the localization of the shopping-goods stores on the west side of the street is that far more people walk on the west side than on the east side of the street. This fact can be verified by a count of the passing pedestrians on each side of the street at any business hour of the day. Two conditions, namely, shade and protection from cold winds help materially to explain why the west side of the street is so much preferred by pedestrians. It is estimated that women make 84 per cent of the family purchases.[2] Approximately the same percentage of their purchases is made in the afternoon, owing to home duties in the morning. The west side of the street is the shady side in the afternoon. The average July temperature in Memphis is 81, and the average January temperature is 41 degrees Fahrenheit. The average diurnal range of temperature in Memphis is approximately 20 degrees, and the hottest time of the day is about 2 p. m. During the heart

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[1] C. K. Rolph and E. J. Carroll, Retail Operating Cost Within a Metropolitan Community (Washington, D.C.: U.S. Department of Commerce, 1934), p. 28.

[2] A. E. Parkins, "Profiles of the Retail Business Section of Nashville, Tenn., and Their Interpretation," Annals of the Association of American Geographers, XX (1930), 169.

of the shopping hours the temperature in mid-summer, therefore, is approximately 91 degrees and that of mid-winter approximately 51 degrees Fahrenheit. At a temperature of 91 degrees, the shady side of the street offers a great inducement to the pedestrian over the sunny side. The average temperature of the winter months in Memphis is not very low, but there are always a number of days when the cold damp winds from the west blow off the river forming a disagreeable condition. These winds blow eastward through the east-west streets and at the intersections with the north-south streets much of their force is deflected up and down the north-south streets. The wind, however, is felt much more strongly on the east side of the north-south blocks than on the west side. Consequently, the west side of Main Street, a north-south street, is protected far more from these disagreeable winds than the east side.

When once important units of the shopping-goods establishments were localized on the west side of Main Street, the force of "functional convenience" was added to the attractive qualities of that side of the street.[1] In order to participate in the business, it became desirable for most other shopping-goods establishments to locate on the west side. The same held true for the specialty-goods establishments as this class includes many of the shops with distinct reputations for quality and service. This addition not only intensified the force of functional convenience on the west side, but added functional prestige as well. The third class of retail establishments, namely, the convenience-goods stores, are conspicuous by their absence on Main Street, but such as do appear, principally grocery stores and eating places, are mainly on the east side. This gives them the advantage of lower rents and taxes.

Sales storage space units.--Of a total of 82.5 sales storage space units, 13 are on the east side and 69.5 are on the west side. These units occupy the parts of sales buildings used for storing and warehousing merchandise, which merchandise is later moved to the sales floors. In virtually all cases, the storage space units are located on floors above sales space units. The

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[1]For a statement of the force of "functional convenience" and other forces affecting the grouping and migration of urban functions, see: Charles C. Colby, "Centrifugal and Centripetal Forces in Urban Geography," Annals of the Association of American Geographers, March 1933, pp. 1-20.

high ratio of 5.3 to 1, of the west side over the east side further reflects the superiority of west side for the sales function.

Service space units.--The part of Main Street under consideration has a total of 372.5 service space units. Of this amount 187 are on the east side and 185.5 are on the west side. These units occupy those functional forms in which public service is rendered, such as hotels, eating places, barber and beauty shops, shoe shops, and picture shows. Both of the large picture shows located on the part of Main Street in this area are on the east side. There are at least two reasons for their east side location, namely, cheaper space for building sites, and the fact that window shopping, which is highly desirable in making purchases, is not necessary in making up one's mind which show to see. Two of the better hotels are located in this area. The one on the west side has 98 service space units whereas the one on the east side has only 38.5 units. Three other smaller hotels which utilize upper floors over sales floors are located on the east side.

Light manufacturing space units.--As might be expected manufacturing is not developed in a large way in the central shopping district, in fact only 1.5 units of space on Main Street was classified under this heading. These are on the second floor of a building on the east side of the street in block three. Some manufacturing space, however, was classified as sales, service, or office space, in case the manufacturing was closely associated with those functions.

Office space units.--Of a total of 285 office space units, 229 are on the east side and only 58 are on the west side. This gives a ratio of 4.1 to 1 in favor of the east side. Of the five office buildings on this part of Main Street, only one is on the west side. Cheaper land, lower rents and taxes, and less competition for space on the part of the sales function are outstanding reasons for the localization of office space units on the east side of the street.

Public-use space units.--The section of Main Street which lies in the central shopping district offers little in the way of public-use space units, only two space units being placed in this category. These included a lodge hall on the second floor of a building on the east side of block one, and on the periphery of the district. This sparsity of public-use space probably is explained by the fact that public functions are not able to pay the

high rents of the central shopping district.

Residential space units.--Fifteen and a half space units in the ten blocks are utilized for residential purposes. Eight units are on the east side and 7.5 units are on the west side. These units are all located on the upper floors of buildings in which the lower floors are utilized for sales purposes. Twelve and a half of the units are in block one and the other three are in block ten. The localization of the residential space units in the end blocks reflects the decrease in rental prices near the extremities of the district.

Vacant space units.--The vacant space units represent all vacant units, except those in office buildings, vacant space in such buildings being included in the office space units. Of the 257 vacant space units in this area, 147.5 units are on the west side and 109.5 units are on the east side. Since the highest percentage of total space units on the east side are office units, and since vacancies in these have not been listed separately, it is apparent that the west side stands relatively low in vacant space units. This is what might be expected at a time of low commercial activity, owing to the desirability of the west side units and to the general stability of these units. Approximately a seventh of all space, except that in office buildings, is vacant. In comparison with the decline of 22.3 per cent of retail establishments from 1929 to 1933, apparently, the loss for the city as a whole was greater than that of the central shopping district.

Functional forms of principal east-west streets.--In order to get a representative picture of the land use of the entire central shopping district, a summary of space units has been made for three of the principal east-west streets from Front Street to the alley east of Third Street. These streets include Madison, the dividing street between north and south Memphis; Adams Avenue, three blocks to the north; and Union Avenue, two blocks to the south. The combination of functional forms is quite different from the one on Main Street. The three and a half blocks on each of the three streets are equivalent to a total of 10.5 blocks. This is a half block more than the ten blocks studied on Main Street. These ten and a half blocks have a total of 2030.5 space units as compared to 1748.5 on Main Street. Since most of the blocks are square, it is deduced that the forms on the east-west streets average slightly higher than those on Main Street. It is

the difference in the use of the functional forms, however, in which the greatest contrast is found. Of the total space units, 39.1 per cent are utilized for office space and 27.5 per cent for service space, the two forming exactly two-thirds of the total space units. Of the remaining space units, 9.5 per cent are used for public-use, 8.1 per cent for sales, 4.3 per cent for residential, 1.6 per cent for sales-storage, and 9.9 per cent are vacant. It is interesting to note that less than a fifth as many sales space units exist as on Main Street; and that 2.4 times as many office space units, and 95 times as many public-use space units are present as on Main Street. Of the 2030.5 space units, 1118.5 are on the south side of the streets and 912 on the north side. The shade factor is an important element in the explanation of the larger number of units on the south side, for during the summer months pedestrians show a decided preference for that side of the street.

Adams Street.--The three and a half blocks under consideration on Adams Street contain 524 space units, as compared with 873.5 on Madison and 633 on Union. This variation in number is due to the fact that, of the three streets, Madison has the largest number and Adams the smallest number of tall buildings. Of the 524 space units on Adams Street, 304 are on the south side and 220 are on the north side. The larger number on the south side is due to the presence of a large hotel on that side of block one, with no compensating high structure on the north side.[1] The largest number of space units on Adams Street are utilized for public-use purposes. In fact, 169.5 of the 192 public-use units of the three streets are on Adams. This concentration is accounted for by the existence of the Central Police Station, the Court House, the Catholic Club, and two large churches on the street. The Court House covers the entire block between Second and Third on the north side, while just across Second Street to the west is the Central Police Station. Fifty-seven and a half space units are utilized for residential purposes. These units with the exception of a Parish Home are all located on the upper floors of the functional

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[1] In referring to the blocks on the three cross streets, Adams, Madison, and Union, block one in either case is the block between Front and Main streets, and block two is the block between Main and Second streets.

forms. Sixty-three and a half space units, or 12.1 per cent of the total, are vacant, a fairly normal percentage of vacancies for the central shopping district at the time of writing.

Madison Avenue.--Madison Avenue with a total of 873.5 space units contains more space units than any other three and a half blocks in the central shopping district. This striking concentration of space units is explained by the presence of tall office buildings, more large office buildings being localized on Madison Avenue than on any other street. Office space units, in fact, compose 71.1 per cent of the total units on this sector of Madison Street. As the city's tallest and largest office building is on the north side of Madison Avenue, it is not difficult to find an explanation for the fact that of the three east-west streets under consideration, Madison is the only one with more space units on the north than on the south side of the street. Other than office space units, service units are the only other type of utilization of importance on Madison Street, the two types taken together making up 84.4 per cent of the total. These service units, as might be expected, are really auxiliary to the office buildings, for a large part of their patronage comes from the office forces. The localization of the large office buildings on Madison Avenue largely is accounted for by the central location of the street in the central shopping district. The intersection of Madison Avenue and Main Street, in fact, is the most active intersection in the city, corresponding to State and Madison in Chicago and Forty-second and Broadway in New York.

Union Avenue.--The part of Union Avenue under consideration has a total of 633 space units, of which 396.5 are on the south side and 236.5 are on the north side. This notable difference is accounted for by the location of two hotels and one large office building on the south side. The office building is located on the corner of Front and Union and functions in connection with the cotton business on Front Street. The Hotel Peabody built in 1924 occupies the entire west side of Union between Second and Third streets. It is a beautiful building with 192 space units, and is considered by all Memphians to justify the slogan printed on the hotel stationery: "The South's Finest, One of America's Best." Just across Third Street to the east is the Hotel Tennessee, a newer but smaller hotel. The location of the hotels in these blocks is explained, in part at least, by the fact that (1) they

are near the heart of the central shopping district, (2) they are convenient to the two railroad stations, and (3) they are located at the crossing of the largest number of highway routes in the city. The presence of these hotels also explains the fact that service space units form 44.8 per cent of the total units. The service units are more than double the office space units, the latter being 20.3 per cent of the total. Next in order of utilized space comes sales space units with 11.5 per cent. Vacant space units, not including the office buildings, form 13 per cent of the total units. It is evident, therefore, that Union Avenue is much less specialized in its display of space units than Madison Avenue.

Localization of functional forms on Second and Third streets.--The summary of space units on Adams, Madison, and Union serves as a fairly good index of the transition in type of functional forms from the center to the periphery of the central shopping district. Land use on Second and Third streets further verifies this statement. The three blocks at the north end of Second and Third streets are dominated by public use buildings. These buildings fall into two groups, the municipal buildings, and the church and club group. As previously stated, the municipal group includes the Court House, the Central Police Station, and the Criminal Courts Building. The two court buildings occupy all the space between Second and Third from Adams to the alley north of Washington. The second group includes three large churches, a parish home, and the Catholic Club. The localization of these public-use buildings in the north end of the central shopping district reflects a more central location in the business district in the early and middle stages of the growth of the city. Closely grouped around the court buildings are numerous offices occupied by lawyers; and city, county, state, and federal officials. A couple of the corners are occupied by service stations, and an automobile parking lot is now under construction. The localization of the automotive forms on contiguous plots to the municipal buildings represents a parasitic land usage, but one with great functional convenience.

The southern seven blocks of the central shopping district are utilized chiefly for office space units, service space units, and sales space units. Five of the large office buildings of the city are in this area. Two such buildings are on Second and three

are on Third, but four of the five also face Madison. Each of the two larger ones, however, has its office entrance on a north-south street and its first floor commercial entrance on Madison.

The service space units of the seven southern blocks include hotels (described in connection with Union Avenue), service stations, shoe shops, barber shops, and miscellaneous service functional forms. The service stations become more numerous south of Union, in the vicinity of the two large hotels. In most cases, they occupy corner locations so that they can be entered from two sides.

The sales space units of Second Street, as might be expected, are considerably more important than those of Third Street. The sales forms of Second Street include the largest two bookstores of the city, paint and wall paper stores, electrical supply shops, automotive accessories shops, stoves and stove parts stores, and some of the more inexpensive apparel shops. The bulk of the sales space units are in the three blocks between Madison and Gayoso. The sales forms of Third Street include, in the main, the type which are not frequented by the masses of people. One of the large Ford Motor dealers, for example, is located on the corner of Third and Gayoso streets, the utility power and light people have an electrical sales room on the first floor of their building on the southeast corner of Third and Madison, the largest wholesale dry goods establishment in the city, moreover, is located on the south side of Third Street between Monroe and Union--a location convenient to the major retail establishments of the city, to many other wholesale establishments, and to the railway terminals. A further illustration of the same principal is the presence of the Memphis Branch of the Federal Reserve Bank of St. Louis on the southwest corner of Third and Jefferson. The business of this bank is with other banks rather than with the people of the city.

Localization of Front Street functional forms.--Front Street, as its name implies, is the nearest north-south street to the water front and thus is the western margin of the central shopping district. This street shows the most striking functional concentration of any street in the central shopping district, in that practically all of the cotton sales activities are localized in the four blocks between Court and Gayoso streets. The 1935 City Directory lists 83 cotton buyers and exporters, and 22 cotton factors in the city. Approximately 2,000,000 bales of cotton are handled

through the Memphis market, and approximately 1,000,000 bales are stored in Memphis warehouses annually.[1] Front Street also has all of the wholesale seed houses, a number of fruit-stands, and several small eating places.

Cotton space units.--Locally, that part of Front Street occupied by the offices and sales rooms of cotton merchants and brokers is spoken of as "Cotton Row." The localization of the cotton business in this row dates back for more than three quarters of a century.[2] At that time the business largely was dependent on river transport and thus Front Street at the top of the bluff was the natural place for it. The development of rail transport did not detract from the convenient location of Cotton Row because the Illinois Central, one of the important carriers, was built along the lower slope of the bluff, and the terminals of the other lines were not far away. In 1924, the localization of the business in the "Row" was increased by the erection of a fine new building at the corner of Union and Front streets to house the Cotton Exchange. Previously this exchange had been located in an office building on the northwest corner of Madison Avenue and Second Street. This location, however, was too inconvenient in relation to the offices of the merchants on Front Street and in 1924 the Exchange moved to the "Row."

The Cotton Exchange occupies the main floor of the Cotton Exchange Building, a building with 60 space units facing Front Street, and 72 units facing Union. The remainder of that building, and most of the other buildings in the four blocks between Court and Gayoso streets are occupied by the offices, display rooms, and storage lofts of the cotton merchants. The Cotton Exchange is not a trading hall, but is a central place to receive the latest information concerning the cotton supply, demand, and prices. The exchange has 175 members, including all of the cotton

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[1]Information is from Mr. A. H. Bower, Secretary Memphis Cotton Exchange.

[2]Frank Haigh Dixon, A Traffic History of the Mississippi River System, National Waterway Commission, Document No. 11 (Washington: Government Printing Office, 1909), p. 19. The author states that Memphis was shipping 100,000 bales of cotton by water annually as early as 1843, but by 1887 the amount shipped by water was considerably less. Young (op. cit., p. 588) states that 100 flatboats were often tied up in the Memphis Harbor at one time as early as 1842.

dealers in the city.

An explanation of the localization of the cotton business in "Cotton Row" and the high intensity of land use in that section calls for an understanding of cotton market practices in general, and the Memphis spot market in particular. The function of a spot market is to distribute cotton from producers to consumers. For this reason the spot markets sometimes are called distributing markets. The country as a whole has three classes of spot markets, country or primary markets, central markets, and mill markets. Memphis is a central market. In general, a central market is a market in which are found the large merchants who buy, for the most part, in the country markets, chiefly from local dealers or from the growers themselves; and who sell to spinners in the United States, and to importers and spinners abroad.[1] While the above definition is true generally, it is not true for Memphis. In Memphis, the merchants buy most of the cotton they handle from the "cotton factors" and "f.o.b. dealers" in the city, making their purchases from samples laid out on long tables in the offices of the sellers. The cotton factors are firms that make loans to growers and country dealers, either during the growing season, to finance the production of the crop, or after the cotton is picked, to finance the holding of it. In either case they take a chattel mortgage on the crop and livestock for the money advanced. In their offices they display samples of the cotton on which they make advances to the growers and dealers and which they sell for a commission. The "spot brokers" are firms who sell cotton on a commission, chiefly for dealers in the country markets; but also to some extent for local holders in central markets. In Memphis, the firms which sell cotton on a commission for country holders are called "f.o.b. men" instead of spot brokers. Like the cotton factors they display samples of the cotton they sell on long tables in their offices.

Scattered along "Cotton Row" also are the offices of domestic shippers who buy from the cotton factors and the f.o.b. men, and who sell chiefly to the domestic spinners; and offices of the exporters who buy from the same sources and who sell chiefly to

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[1]A. H. Garside, "Spot Markets: In the South and in New England," Cotton Goes to Market (New York: Frederick A. Stokes Co., 1935).

foreign importers and foreign spinners. Slightly different from the exporter is the "c.i.f. broker." The letters stand for cost, insurance, and freight; and indicate that the buyer is one who buys on commission for foreign importers and foreign spinners, on terms that specify that the insurance and the freight to the foreign destination are included, together with the cost of the cotton, in the price stated in the invoice. Finally, there are in the district, the offices of a few mill buyers who buy from the domestic shippers, f.o.b. men, and other sources. The American Cotton Cooperative Association, which buys both through the country and central markets and sells through its own organization at New Orleans, also has an office in the area. All of these buyers are interested in the displays of the cotton factors and f.o.b. dealers and thus all want offices close to these selling agencies. This accounts for the extraordinary localization of the business and, with the need of the selling agencies for display and storage space, accounts for the high intensity of land use.

Seed space units.--Memphis long has been an important center for the distribution of vegetable seeds, cotton seed, and potatoes and other kinds of seed. The seeds are brought to Memphis from many parts of the country and are distributed through Memphis to the agricultural area of which Memphis is the center. The seed houses do both a wholesale and retail business and all of them listed in the City Directory are located on Front Street in this area. There are seven of these and five are localized in the three blocks between Jefferson and Monroe. The older of these firms dates back to a time when the city was small, and when a considerable portion of the seed was received and shipped by water. Three of the stores are located directly above the municipal wharf. Today their position on Front Street places them near the railway terminals and near the main highway routes leading out of the city.

Fruit-stand space units.--The picturesque fruit stand with its roof extending out over the sidewalk, and the walk partially or almost wholly blocked with boxes and baskets of fruit is one of the characteristic scenes on Front Street. The five stands are all north of Madison Avenue. Most of these also date back to the early and middle stages of the city when there was a larger percentage of pedestrians on Front Street, owing to the greater importance of river activities. Today, their location on Front Street places them along the route of pedestrians going from Main Street to their

parked cars on the east-west streets west of Front Street and to the parking spaces along the lower slopes of the bluff. These Front Street locations also give them low rentals, plenty of room, and proximity to the Illinois Central Railroad, an important fruit carrying line. From the point of view of localization, it is interesting to note that the cotton business and the fruit business overlap in only one block, the block between Court and Madison.

Eating places space units.--The small and inexpensive eating places scattered along Front Street cater, at present, largely to the employees in the commercial activities carried on along the street. In virtually all of these eating houses, a stock of cold drinks is carried from which the proprietors derive a considerable portion of their total income.

Findings and Conclusions for the Heterogeneous Belt and for the Outlying Commercial Districts

1. The heterogeneous belt is a crescent shaped area which surrounds the central shopping district on the north, east, and south. The uses of the functional forms in this belt are so complex both vertically and horizontally that it seemed impracticable to try to classify the individual uses of the land. For the purpose of expedience, however, the belt is broken down into three parts: a north end, a central part, and a south end.

2. The north end and central part of the belt are not only complex areas functionally, but also are areas undergoing rapid transition. A large percentage of the old residential forms have been torn down and commercial forms built on their sites. The migration of commercial forms into the belt is taking place fastest toward the east. The most advanced tentacles of commercial lands lie along the arterial streets which lead out from the central shopping district as evidenced by the automotive function on Union Avenue.

3. The five blocks on Beale Street east of Main constitute the outstanding negro commercial center of the city. This street lies between the central shopping district on the north and the largest negro residential area in the city on the south. The buildings are two and three stories high. In the main, the ground floors are used for sales and service functions whereas the upper floors are used for storage, office, and residential purposes. The suits, shoes, hats, dresses, and other articles of wearing apparel hanging from sheds and awnings protruding over the side walks, the

huge brass balls in front of the various pawn shops, and the groups of negroes loitering around the street corners form a distinctive scene in the city's landscape.

4. The principal wholesale and warehouse district of the city is located in the south end of the heterogeneous belt and on and west of Main Street. Localization in this area represents a combination of several conditions. In the first place, this wholesale area lies near the river, a condition of prime importance in the early days when transportation was largely by water. In the second place, with the coming of the railroads, the area was so centrally located that spur tracks could be built to it without great expense, one line in fact bisected the area. In the third place, the area was the closest available site to the center of the old town, the north and east margin of the central area being already utilized for residential purposes. In the fourth place, the site itself invited localization of a function which required plenty of space for buildings, warehouses and yards, in that the Mississippi turns to the west just above this point leaving an area three blocks wide west of Front Street. Finally, the area was unattractive to the residential function and has remained virtually free from residential usage.

5. The outlying commercial lands break down into two classes, those on which are localized functions with local trade areas, and those on which are localized functions with trade areas reaching beyond the city. In the first class are the lands occupied by various sales and service establishments such as grocery stores and drug stores. In the second class are such commercial lands as (1) the automobile district on Union Avenue, (2) the gasoline and oils nuclei, (3) the stock yards, (4) the iron and steel goods distributing nuclei, and (5) the cotton compress and storage warehouse lands.

6. Of the numerous small outlying commercial districts occupied by sales and service establishments with local trade areas, 21 were studied and mapped in detail. These 21 contain 880 ground floor functional forms. Of this number 145 are residences and 735 are commercial forms. Of the 735 commercial forms, 75, or 10.2 per cent are more than one story high, but the usage of the upper floors are not included in the following tabulations. Using the 735 commercial forms as a base, 11.3 per cent are grocery stores, 10.6 per cent are eating places, 9.1 per cent are barber and beauty

shops, 6.0 per cent are drug stores, 5.3 per cent are filling stations, 3.9 per cent are shoe shops, 3.5 per cent are dry goods stores, 3.0 per cent are cleaning establishments, 2.3 per cent are offices of professional people, 2.2 per cent are hardware stores, 2.2 per cent are used for light manufacturing, 10.6 per cent are vacant, and 29.0 per cent are used for 42 other kinds of sales and service establishments, no one class of which has more than two per cent of the total. Most of these sales and service establishments are of the convenience type.

7. The automobile district extends for about twenty blocks along Union Avenue eastward from the edge of the central shopping district. The migration of the automotive function out this street which formerly was a very high type residential street has brought about one of the most marked transitions in the city. The forces which brought about the localization of the new function were functional convenience. functional magnetism and functional prestige. Because many of the automobiles, both new and second-hand, are sold to customers living outside the city, this district has a regional as well as a local importance.

8. The commercial lands utilized for handling gasoline and oils include the receiving plants, the bulk distributing plants, and the filling stations. Of the companies handling petroleum products only the three which receive their gasoline, kerosene and oils by barge have both receiving plants and bulk distributing plants. The receiving plants of necessity are located at the edge of the Mississippi, the bulk distributing plants are scattered along the railroads in the middle and outer zones, and the filling stations are scattered over the entire city. Gasoline and oils from the bulk distributing plants are sent to middle and west Tennessee, east Arkansas, and north Mississippi. The lands utilized for gasoline and oils therefore are of regional as well as of local significance.

9. The stock yards, in the main, consist of two yards used for the sale and handling of cattle, sheep, and hogs; and one yard used for selling mules and horses. The latter and one of the former are located in the small area served by the cluster of railroad tracks and spurs southwest of the terminal district. The other cattle, sheep and hog yard faces the Leewood yards of the Louisville and Nashville Railroad in the northeastern part of the city. Each of the cattle, sheep and hog yards is contiguous to a

slaughtering and meat packing plant. In 1934, approximately 75,000 mules and horses (80 per cent mules) were sold through the horse and mule yards. The mules and horses are collected from and distributed to the majority of the states in the Union, a situation which makes these yards of local, regional, and interregional importance.

10. The pipe yards and the warehouses of the firms distributing iron and steel goods are scattered through a narrow belt that lies just east of the Wolf and Mississippi rivers. The oil pipe and other steel products are shipped to Memphis by water, and later most of these products are shipped to the consuming markets of the South and Southwest by train. Consequently, a location along the water front and on the Illinois Central with its belt line services is of great convenience in this business. In view of the origin and distribution of the iron and steel products, it is evident that the lands utilized for pipe yards and warehouses for iron and steel goods have a local, regional, and interregional significance.

11. Three land parcels inside the city are utilized for cotton compress and storage warehouses. These warehouses cover approximately 45 acres and have a storage capacity of 185,000 bales of cotton. Three other similar warehouses are located just south of the city, the largest one covering approximately 250 acres and having a storage capacity of 185,000 bales. All of these plants are located in the outer part of the urbanized area, at sites where highway and railway facilities are good, and where land is relatively cheap. The cotton compressed and stored in the Memphis warehouses comes from most of the cotton producing states in the Union, and cotton is sent from these warehouses to countries in every inhabited continent. These lands therefore have a local, regional, national, and international usage.

CHAPTER VI.--LAND NOT UTILIZED FOR URBAN PURPOSES

1. The non-urbanized lands of the city include all lands not utilized for urban purposes. Such lands compose approximately 17 per cent of the total area of the city. No effort was made to ascertain which of these lands are used periodically or otherwise for agricultural purposes. There are four principal areas of non-urbanized lands in the city. The first is the low peninsula of land lying between the Wolf and Mississippi rivers, known locally as Mud Island. This area is not used for any urban purpose owing to the fact that it is frequently flooded. The second non-urban-

ized area extends along Cypress Creek in North Memphis, the third area lies along the Nashville, Chattanooga and St. Louis Railroad in East Memphis, and the fourth area lies near the border of South Memphis.

2. The non-urbanized lands of the three areas east of the Mississippi and Wolf rivers break down into seven types: (1) lands near railroads, (2) lands near manufactural plants, (3) lands recently used for urban purposes, (4) lands recently taken into the city, (5) swamp lands, (6) bayou lands, and (7) forest groves.

3. The non-urbanized lands in North Memphis are chiefly bayou lands, swamp lands, and lands recently taken into the city, but all seven types are present in the area.

4. The non-urbanized area in East Memphis is slightly larger than either of the other two areas east of the rivers. This area, in the main, is made up of lands recently taken into the city, lands near railroads, and forest groves.

5. The non-urbanized area in South Memphis is the smallest of the three, and is composed of two noncontiguous parts. Its lands, in the main, are lands recently taken into the city, lands near railroads, lands near manufactural plants, and forest groves.

GENERAL CONCLUSIONS

1. Of the total land area in Memphis, approximately 38 per cent is utilized for residential purposes, 36 per cent for public purposes, 5.5 per cent for transportational and manufactural purposes, 3.5 per cent for commercial purposes, and 17 per cent are non-urbanized lands.

2. The urban area of the city forms a rectangular pattern, the north-south axis of which is about 75 per cent as long as the east-west axis. The city is definitely confined on the north, west, and south by water barriers, but the area to the east offers no natural barriers to urban development.

3. The city pattern contains a central compact or built-up area lying within the Belt Line Railroad, and a periphery with a mixture of built-up and non-urbanized lands. The former largely represents a development of the early and middle stages in the growth of the city, whereas the latter development has taken place during recent decades.

4. The central compact residential area is separated from the more open peripheral residential area by both physical and cultural barriers. The physical barrier is the break in the street

pattern made by the rights of way of two closely spaced north-south railroads. Most of the east-west streets do not cross these rights of way, and only four streets have grade separations. The cultural barrier results from the presence of a series of negro residential districts spaced at intervals along the railroad tracks. These negro districts developed at the eastern margin of the city in the period when the city's growth was primarily northward and southward.

5. Functional localization within the city is related in many ways to the rivers and creeks which bound and drain the city, to the steep bluff of the Mississippi which the city faces at the west, to the relatively level and well drained terrain which extends eastward and which lies between Wolf River at the north and Nonconnah Creek at the south, to the terminals and rights of way of the railroads, to the periods in the growth of the city in which the localization occurred, and to a long list of miscellaneous conditions.

6. The lands of the city as a whole are wisely utilized, and most activities are well placed in the city pattern. Striking exceptions are found (1) in certain areas along the river front where lands designated by the founders of the city for recreational purposes have been utilized for other purposes, (2) in the rights of way of two old and little used railroads which cut across the central residential area, (3) in Parkway Boulevard, which no longer serves its original function, and (4) in the classification yards which now lie in the built-up area of the city. Most of the unwise uses of land in the city today are due largely to the areal growth of the city.

7. Most of the land parcels of the city used for public purposes other than streets are located in the inner part of the city, but all the parcels with large acreage are located in the outer part.

8. The major railroad axis of the city is an east-west axis focusing on Railroad Avenue and the bridges spanning the Mississippi, whereas the minor axis is a north-south axis paralleling the river.

9. Manufacturing has migrated from its original north-south alignment along the river to two new east-west alignments, one along the northern and the other along the southern margin of the city.

10. The commercial lands of the city form a symmetrical pattern. The hub of the pattern is formed by the central shopping district, which extends along the lower part of Wolf River for ten city blocks. Surrounding it is the heterogeneous belt (a crescent shaped transition zone), and extending outward from it are eleven radii of commercial lands which follow the arterial streets of the city.

11. The nonconformance of the built-up lands and the incorporated area, due largely to the expansion of the city in 1929, unfavorably affects the city budget. The expenses of the city would be less if certain of the non-urbanized lands in the east and south parts of the city had not been taken into the incorporated area, and the tax receipts would be more if the long narrow manufactural belt just south of the city and the small cluster of manufactural plants in the northwest corner had been included.

12. Approximately 13 per cent of the non-urbanized lands are zoned for residential purposes. There is therefore in the city at present a third as much non-urbanized land zoned for residential uses as occupied residential land. This does not mean that the present area of the city is adequate for housing a third more people (85,000), for about ten per cent of the non-urbanized land is zoned for a restricted type of residential usage which does not permit residential forms larger than two-family dwellings. It is believed, however, that the areal pattern of the city is adequate for housing 25 to 40 thousand more people in types of residential forms meeting the specifications of the present zoning laws.

13. The proposed use of the land of the city as shown by the use district map of the City Planning Commission does not conform to the actual use as shown by the land utilization map (Map-A). The nonconformance is due to the fact that most of the functional forms which occupy the land at present were constructed prior to the zoning of the city in 1924 by the City Planning Commission. Commercial forms constitute the most numerous and widespread phenomena of nonconformance, particularly the commercial forms set in the residential areas.

14. Eventually, the city probably will reach the point where it will be necessary to extend its areal limits. Prior to this date Wolf River probably will be made navigable as far east as the present limits of the city. If and when this is done, the north boundary should be moved northward to include any port lands which

might be developed. Nonconnah Creek, which flows westward just south of the present limits of the city, cannot easily be made navigable, and it is not likely that the low wet lands lying along its north bank ever will be desirable for urban purposes. The south boundary of the city, however, may well follow an east-west line lying at the north edge of the marsh lands. A straightening of the south boundary will add symmetry to the city pattern. The eastern boundary is likely to remain a north-south line, owing to the lack of any natural barrier to urban development. Taking into consideration the surrounding barriers, it seems safe to predict that as the city grows it will become more nearly rectangular in shape, and that the ratio of the east-west axis to the north-south axis will increase.